USSR

UDC 535.322.4.08

AYOLLO, E. S., DMITRIYEV, A. V., KARABEGOV, M. A., KOHRAKOV, YU. I., POZHIDAYEV, G. M., SIMONYAN, G. A.

"New Wide-Range Automatic Refractometer for Monitoring the Course of Technological Processes"

Translation: At the present time, among automatic industrial refractometers, the systems with optical compensation for the deviations of the light beam, displacement of the light shadow interface and under variables which are a function of the index of refraction have become most widespread. The schematic and description of an automatic refractometer developed by the Special Design Office for Analytical Instrument Making are presented. This refractometer permits an increase in the dynamic measurement range by several times while retaining the given instrument error. It also permits a five-fold increase in the accuracy of measuring the concentration of the substance. There are 2 illustrations and 1-entry bibliography.
1/1

Acc. Nr: AP0043755   DMITRIYEV A.V.   Ref. Code: UR 0050

PRIMARY SOURCE: Meteorologiya i Gidrologiya, 1970, Nr 3,
                pp 53-94

GAMMA-RAYS SURVEY OF SNOW COVER FROM AIRCRAFT
Dmitriyev, A. V.; Kogan, R. M.; Nikiforov, M. V.;
Fridman, Sh. D.

Physical prerequisites and methods of measuring the snow cover by means of gamma-rays survey from aircraft are stated; problems of mapping the snow resources over large territories are being considered.

REEL/FRAME
19770161

USSR   UDC 669.245'26'295'71:620.186:669.018.2:621.785.78

PAISOV, A. I., DMITRIYEV, L. I., ANISIMOVA, G. V., and KORNEYEVA, N. N.

"Study of the Effect of Aging Temperature on the Structure and Properties of KhN77TYuR Alloy"

Translation: The interrelationship is found between σ_{100} and $\sigma_{0.2}$ at 700 and 800° (from reference data),characterized by the correlation factor 0.9 and 0.86 respectively, as well as between σ_{1000}, $\sigma_{0.2}$ and testing temperature, correlation factor 0.71. KhN77TYuR alloy was tested after heating to 1080°, 8 hr, with subsequent aging at 700-850°, 16 hr. An aging temperature increase in the 700-800° range increases heat resistance and stability of structure. Aging at 850° sharply reduces rupture strength as a result of a decrease in the quantity of the strengthening phase. Air cooling from 1080° assures a higher rupture strength as a result of further aging in tests than with subsequent

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USSR

PAISOV, A. I., et al., Tekhnol. legkikh splavov, Nauchno-tekhn. byul. VIISa, 1970, No 5, pp 97-102

aging at 700 and 800° (35^{750} 150 hr as against 95 and 120 hr respectively).

0.2 changes analogously. Four illustrations. Bibliography with seven titles.

2/2

BUSHMIN, A. S., DMITRIYEV, L. M., Moscow

"Experimental Determination of the Vibrational Temperature of a Super-
sonic Gas Flow"

Moscow, Teplofizika vysokikh temperatur, No. 3, May/Jun 72, pp 499-502

Abstract: An experimental study of the vibrational temperature of air
molecules in the nonequilibrium supersonic gas flow of a device with an
electric arc heater is described. It is noted that high-speed processes
in gases, such as the propagation of strong shock waves and the supersonic
expansion of a jet are accompanied by a breakdown in thermodynamic equi-
librium, and that inside the corresponding groups of degrees of freedom
of the molecules there occurs a Boltzmann energy distribution characterized
by the kinetic, rotational and vibrational temperatures; the equilibrium
correspondence between these temperatures could not be established, how-
ever. Theoretical calculations of the vibrational temperature are difficult
in this case due to the absence of reliable data on the deactivation time.
It was shown previously that deactivation times of vibrational degrees of
freedom in an expanding supersonic flow can be one or two orders of
magnitude less than the relaxation time of vibrations under excitation

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USSR

BUSHMIN, A. S., DMITRIYEV, L. M., Teplofizika vysokikh temperatur, No. 3, May/Jun 72, pp 499-502

behind shock waves due to the presence in the flow of admixtures of chemically nonequilibrium components which catalyze the deactivation processes. The vibrational temperature was measured on the basis of the radiation spectrum of a sodium additive. A sodium additive introduced into a supersonic gas flow ($M \approx 8$) through a prechamber was in an excited state ($T_{ex} \sim 1500°K$) at the static gas temperature ($T_{st} \sim 300°K$). Analysis of possible excitation and quenching processes for the sodium atoms showed that the excitation temperature is no more than 15% below the quenched vibrational temperature. It is noted that the application of this method of measurement requires careful analysis of the sodium excitation processes. Analysis of energy balance equations for molecule vibrations showed that only vibrational energy transfer to translational degrees of freedom of the molecules and atoms are essential for relaxation of vibrations. Thus the excitation temperature for atoms of the alkali metal additive in a supersonic flow in a device with an electric arc heater for the gas can be identified with the vibrational temperature T_{vib} with a correction of a magnitude depending on the specific experimental conditions. Analysis showed that values of T_{vib} are less than those calculated under the assumption that the deactivation times are equal to relaxation times measured behind the shock wave by a magnitude considerably exceeding the correction.

USSR

UDC 532+533/533.6

DMITRIYEV. L. S.

"Analysis of Variation of the Indexes of Isentropy in a Strongly Disso-
ciated Gas Flow"

Tr. Vses. nauchno-tekhn. konferentsii po termodinamike. Leningr. tekh-
nol. in-t kholodiln. prom-sti (Works of the All-Union Scientific Research
Conference on Thermodynamics. Leningrad Technological Institute of the
Refrigeration Industry), Leningrad, 1970, pp 160-168 (from RZh-Mekhanika,
No 10, Oct 70, Abstract No 10 B903)

Translation: This article contains an analysis of the variation of the
thermodynamic parameters of an equilibrium gas at temperatures of 2,000-
5,000° K (for oxygen). The indexes of isentropy, individual and molar
heat capacitance, the ratio of the specific heat capacitances, and so on
are calculated for the isentropic processes. The existence of three re-
gions of conditions in the dissociating gas flows is noted: 1) region
of strong dissociation, 2) transient region, 3) regions of undissociated
gases.

1/1

1/2   020   UNCLASSIFIED   PROCESSING DATE--18SEP70
TITLE--STANDARDIZATION IN TEACHING PROCEDURE AND IN PREPARATION OF YEARLY
AND DIPLOMA DESIGN PROJECTS -U-
AUTHOR-(03)-SHAPOVALENKO, A.M., KHUTSIYEV, A.I., DMITRIYEV, M.M.

COUNTRY OF INFO--USSR

SOURCE--STANDARTY I KACHESTVO, 1970, NR 2, PP 52-54

DATE PUBLISHED-------70

SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--DESIGN STANDARD, TEACHING PROCEDURE, ADVANCED EDUCATION
QUALITY, DIPLOMA PROJECT, R AND D EFFECTIVENESS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1985/0328   STEP NO--UR/0422/70/000/002/0052/0054

CIRC ACCESSION NO--AP0100815
                    UNCLASSIFIED

CIRC ACCESSION NO--AP0100815
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SPECIALISTS GRADUATED FROM THE
HIGHER SCHOOL SHOULD BE PREPARED BETTER, THE AUTHORS THINK. IT IS
SUGGESTED THAT ALL THE INSTITUTES TEACH A COURSE OF FUNDAMENTALS OF
STANDARDIZATION. ALL TYPES OF STUDENTS' WORKS SHOULD BE FORMULATED TO
CERTAIN DESIGN STANDARDS WHICH REQUIRE WORKING OUT AND INTRODUCTION IN
PRACTICE AT THE INSTITUTES.

UNCLASSIFIED

USSR   UDC 614.715(-21)-037

DMITRIYEV, M. T., IVANOVA, L. Yu., and CHON EN DE, Institute of General
and Communal Hygiene imeni A. N. Sysin, Academy of Medical Sciences USSR,
Moscow, and State University imeni M. V. Lomonosov, Moscow

"Hygienic Prognosis of Photochemical Smog Formation in Cities"

Abstract: UV radiation at wavelengths of 320-330 nm plays the most important
role in the formation of photochemical smog in the air. An equation for the
rate of formation of photooxidants in the air calculated as O_3 was derived
in earlier work by Dmitriyev et al (Gig. i San., No 10, p 6, 1971). By
using this equation and estimating the amount of effective UV radiation under
consideration of direct and scattered radiation as well as of UV radiation
absorbed by O_3 in the stratosphere, the rate of formation of photooxidants
and of photochemical smog in 17 USSR cities located at various latitudes
ranging from 69.1°N (Murmansk) to 38.0°N (Ashkhabad) could be calculated
(table). The assumption was made that the principal source of atmospheric
pollution was formed by automative exhaust gases in an amount corresponding
to a CO concentration of 100 mg/m3 in the air. Curves were obtained which
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USSR

DMITRIYEV, M. T., et al., Gigiyena i Sanitariya, No 2, Feb 73, pp 8-13

indicated that the maximum rate of photochemical reactions that determine
the formation of smog must be at noon hours in June in northern USSR cities
and in Jul-Aug in southern USSR cities. It is pointed out that if the
existing USSR requirements for the maximum concentrations of pollutants in
the air that should not be exceeded are fulfilled, photochemical smog
cannot form. At a concentration of automotive exhaust gases corresponding
to /CO/ = 1 mg/m^3 and /NO$_2$/ = 0.085 mg/m^3, /hydrocarbons/ = 3 mg/m^3, the
maximum rate of photochemical reactions at noon even in the southernmost
cities of the USSR does not exceed 0.018 mg/m^3.hr, which is 20 times lower
than that at which a photochemical smog may still form.

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DMITRIYEV, M. T.

SURVEY OF CURRENT METHODOLOGICAL APPROACHES IN HYGIENIC RESEARCH

UDC: 613/.614-07:001.8

In accordance with the main direction of our institute, investigation of the effect on the human body and on public health of diverse environmental factors, the chief direction of research.In specialized laboratories is to determine the patterns of interaction between the organism and environment using physiological, biochemical, morphological, radiological, and physico-chemical investigative methods.

In the last few years, in connection with expanded studies of the effect of diverse environmental factors on the functional state of the organism and on public health, special attention has been given to development and adoption of new methodological approaches in conducting mass examinations. In this respect, a special place is occupied by methods of functional diagnosis of early functional changes in different systems and in the body as a whole. The main objective of mass examinations is not so much to detect overtly patho-logical consequences as to determine the degree of tension of regulatory mechanisms that prevent impairment of the normal state of the internal medium of the organism. Thus, for clinical and physiological surveys of the population such functional tests are used as the adrenal test, purine load test, diagnostic acid test, Volhard's and McClure-Aldrich tests, cold test, and a number of others.

Particularly fruitful are studies of interaction of different systems in the integral organism, permitting reliable substantiation of environmental conditions most compatible with a physiological state of the body.

Thus, in a mass study of the population for the purpose of investigating the effect of desalinated drinking water on the functional state of the organism, water-salt metabolism, cardiovascular condition, renal activity, gastrointestinal tract function, and complex reflex drinking reactions were examined.

Only the indices that have actual significance for the organism can be characterized as having a criterion of harmful affect. For example, decreased

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USSR   UDC: 621.472:621.383

GUTKIN, A. A., DMITRIYEV, M. V., and SMYSLOV, Yu. N.

"Optical Constants of a Gold Film and Light Transmission Coeffi-
cient of a Semiconductor for Au-GaAs and Au-GaP Photoconverters
in the 254-644 nm Wavelength Range"

Tashkent, Geliotekhnika, No 1, 1972, pp 19-24

Abstract: To fill out what the authors, associated with the
A. F. Ioffe Physico-Technical Institute, regard as incomplete
experimental data of the effective optical constants of gold
films obtained through sputtering in a vacuum, the present arti-
cle determines the constants. It computes the index of refrac-
tion, the absorption factor, and the effective thickness of the
films from experimental data of the transmission factor and re-
flection coefficient of the thin gold film on a quartz substrate,
under visible and ultraviolet light. The film thickness amounted
to 8-40 nm. Results of this experimentation, made with an error
factor of no more than 5%, agreed closely with the results of ear-
lier data obtained in the spectral range of 253.6-643.8 nm by R.
Philip (J. Phys. Radium, 20, 535, 1959). With the values of the
factors obtained by the authors, they computed the light trans-
mission factor of Au-GaAs and Au-GaP surface barrier photoelements.

1/1   - 74 -

1/2   038   UNCLASSIFIED   PROCESSING DATE--04DEC70
TITLE--EFFECT OF AN ELECTRIC FIELD IN THE SPACE CHARGE LAYER ON THE
   PHOTOSENSITIVITY OF A GOLD N GALLIUM ARSENIDE CONTACT NEAR THE
AUTHOR-(02)-GUTKIN, A.A., DMITRIYEV, M.V.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(2), 282-6

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--ELECTRIC FIELD, PHOTOSENSITIVITY, GOLD, GALLIUM ARSENIDE,
   PHOTON, SPACE CHARGE, INDIUM, ETCHED CRYSTAL, METAL FILM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/1867   STEP NO--UR/0449/70/004/002/0282/0286

CIRC ACCESSION NO--AP0118831
                          UNCLASSIFIED

CIRC ACCESSION NO--AP0118831

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONDITIONS ARE DETD. UNDER THE
PHOTOCURRENT CHANGES ARE PROPORTIONAL TO THE ABSORPTION CHANGES IN THE
SPACE CHARGE LAYER OF PHOTONS WITH AN ENERGY OF SIMILAR TO 1.8 EV. THE
CONDITIONS ARE LARGELY SATISFIED BY N-GAAS SAMPLES WITH A CARRIER D. OF
10 PRIME17-CM PRIME3 AND A MOBILITY OF 2800-3800 CM PRIME2-V SEC. OHMIC
CONTACTS WERE PREPD. BY ALLOYING IN IN A H ATM. AT 500DEGREESC FOR 2
MIN. AFTER ETCHING THE CRYSTAL A SEMITRANSPARENT AU FILM (100-200
ANGSTROM THICK) WAS VACUUM EVAPD (5 TIMES 10 PRIME NEGATIVE5 MM HG) UPON
THE SIDE OPPOSITE TO THE CONTACT.   ALL MEASUREMENTS WERE CARRIED OUT AT
SIMILAR TO 80DEGREESK. THE CAPACITANCE VOLTAGE CURVE IS NOT THAT OF A
SCHOTTKY TYPE BARRIER. THE MAX. THICKNESS OF THE SPACE CHARGE LAYER IS
(2.5-4) TIMES 10 PRIME NEGATIVE5 CM.   THE DIFFUSION LENGTH OF HOLES IS
(2-8) TIMES 10 PRIME NEGATIVE6 CM. THE RELATIVE PHOTOSENSITIVITY
SPECTRA AT VARIOUS BIAS POTENTIALS SHOW THAT THE CHANGES IN THE SPACE
CHARGE LAYER ARE ASSOCD. WITH THE INCREASE OF THE PHOTOCURRENT WITH THE
NEG. BIAS POTENTIAL. THE SPECTRA REVEAL A MIN. AND A MAX. WHICH CANNOT
BE EXPLAINED BY CHANGES IN THE SPACE CHARGE LAYER THICKNESS BUT ARE
RELATED TO VARIATIONS IN THE ABSORPTION COEFF. (FRANZ-KELDISH EFFECT).
THE NALA. OF EXPTL. DATA YIELDS THE ELEC. FILED DEPENDENCE OF THE
ABSORPTION OSCILLATION PERIOD, WHICH TURNS OUT TO BE IN GOOD AGREEMENT
WITH THEORETICAL EXPECTATIONS.   FACILITY: FIZ.-TEKH. INST. IM.
IOFFE, LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC 620.1+621.9.035

VERESHCHAGIN, L. F., Academician, SEMERCHAN, A. A., MODENOV, V. P., BOCHAROVA, T. T., DMITRIYEV, M. YE., Institute of High-Pressure Physics of the Academy of Sciences USSR, Moscow

"Synthetic Diamond -- A Material for High-Pressure Chambers of the Order of a Megabar"

Moscow, Doklady Akademii Nauk SSSR, Vol. 195, No. 3, 21 Nov 70, pp 593-594

Abstract: The problem of obtaining pressures of 1 megabar and above in high-pressure chambers can be solved, in the opinion of the authors, by using composition material based on synthetic microcrystalline diamonds. It is noted that pressures that can be achieved in high-pressure equipment depend not only on the construction of the equipment but also primarily on the physicomechanical properties of materials used to make the essential parts of the equipment. Tungsten carbide is known to become so plastic after reaching a pressure, in the central part of the equipment of the order of 400 kbar that a further increase in load does not lead to an appreciable rise in pressure inside the chamber. The example given for the reason for interest in achieving pressures of the order of several megabars is the theoretical calculations

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USSR

VERESHCHAGIN, L. F., et al, Doklady Akademii Nauk SSSR, Vol. 195, No. 3,
21 Nov 70, pp 593-594

of Schneider [Helv. Phys. Acta, 42. Fasc. 7/8, 957(1969)]
who showed that it is possible to obtain metallic hydrogen at a pres-
sure of the order of 2 megabars which probably has the properties of a supercon-
ductor with a high critical temperature. Samples of the materials were produced
in a high pressure and temperature device of large capacity. Pressure was necessary
in this case not only to reduce the graphitization of the diamond grain under heating
but also to produce a sufficiently dense diamond-containing briquet. A metallo-
graphic study of the structure showed a predominance of diamond crystals, while the
binding was the smaller portion of the volume of the material. The diamond grains
have multiple contacts and apparently form a three-dimensional framework, as dis-
tinct from existing abrasive compositions in which diamond crystals are isolated
from one another by the binder. The hardness of samples with a grain size of 2-3 μ
was on the average 97 HRA. The elastic modulus as determined by an ultrasonic
method on samples of size 12 × 8 mm with a grain size of 10-15 μ was ~60,000 kG/mm^2.
It is concluded that exceptional hardness exceeding the hardness of known
metallo- and mineral-ceramic solid alloys, in combination with a sufficiently high
elastic modulus-can be obtained in diamond compositions with a high concentration
of diamond and a minimum concentration of binder made by the application of high
pressures.
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Mechanical Properties

USSR   UDC 621.791.89:669.04

ABRAMOV, O. V., DMITRIYEV, N. N., and SVISTUNOVA, T. V.

"Ultrasonic Treatment of Corrosion-Resistant Nickel Alloys During Their
Vacuum Electric Arc Melting"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 2, Mar/Apr 73, pp 145-146

Abstract: Corrosion-resistant nickel alloys ON70M27F, OKh15N65M16B, and
N85S8D3L were subjected to ultrasound during their melting to see what effect
it would have on their mechanical and industrial properties which were deter-
mined after alloys were subjected to hot deformation at 900-1250°C. Plasticity
of alloys ON70M27F and OKh15N65M16V was slightly higher after ultrasonic treat-
ment, but their corrosion resistance, as well as resistance to intercrystalline
corrosion was uneffected. Macrostructure of all alloys became smaller in size,
but the microstructure of ON70M27F and CKh15N65M16V remained unchanged, and
that of alloy N85S8D3L became nonuniform. Malleability of the first two alloys
was slightly higher after the ultrasonic treatment compared with controls.

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USSR   UDC 669.017:539.16.04

ABRAMOV, O. V., DMITRIYEV, N. N., KUDEL'KIN, V. P., LAKTIONOV, V. S., and
MILENIN, Ye. N., Moscow

"Ultrasonic Treatment of High-Heat-Resistance Nickel Alloys"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 3, May-Jun 71, pp 67-72

Abstract: The steels Kh20N80, EI437B, EP109, and EP220 were ultrasonically
treated in the process of vacuum arc remelting, in order to improve their
qualities by size reduction of macro-and micro-grains and removal of the zone
of acicular crystals. The change of the ingot structure resulted in a con-
siderable increase of plasticity properties of the cast material in the
interval of hot deformation temperatures. The surface of bars obtained from
ultrasonically treated ingots shows a considerably higher quality than the sur-
face of bars from control ingots. The impact toughness of the rolled iron,
obtained from ultrasonically treated alloys EP109 and EP220, increased in the
interval of deformation temperatures by approximately two times in comparison
with control ingots. Three figures, one table, four bibliographic references.

1/1

Mechanical Properties

USSR   UDC 669.76:79

SOKOLOV, L. D. (Editor), SKUDNOV, V. A., SOLENOV, V. M., GLADKIKH, A. N.,
SHETULOV, D. I., SHNEYBERG, A. M., GUSLYAKOVA, G. P., and DMITRIYEV, N. P.

Mekhanicheskiye Svoystva Redkikh Metallov (Mechanical Properties of Rare
Metals), Moscow, Izdatel'stvo Metallurgiya, 1972, 288 pp

Translation of Annotation: A study is made of the mechanical properties
(deformation resistance, plasticity, fatigue, creep, and stress-rupture
strength) of rare and other metals, and their dependence on temperature and
deformation rate. Characteristics of strain hardening, the stress and
plasticity dependencies on temperature and deformation rate parameters, and
other experimental data are discussed on the basis of the theory of defects
and other contemporary concepts regarding the type of bonds in crystals.

The book is intended for scientists, engineers, and technicians at institutes,
design institutions, nonferrous metallurgy plants, machinebuilding plants,
and power engineering stations. It can also be useful to aspirants and
students in higher educational institutions.

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SOKOLOV, L. D. (Editor), et al., Mekhanicheskiye Svoystva Redkikh Metallov (Mechanical Properties of Rare Metals), Moscow, Izdatel'stvo Metallurgiya, 1972, 288 pp

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USSR

SOKOLOV, L. D. (Editor), et al., Mekhanicheskiye Svoystva Redkikh Metallov (Mechanical Properties of Rare Metals), Moscow, Izdatel'stvo Metallurgiya, 1972, 288 pp

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USSR

SOKOLOV, L. D. (Editor), et al., Mekhanicheskiye Svoystva Redkikh Metallov (Mechanical Properties of Rare Metals), Moscow, Izdatel'stvo Metallurgiya, 1972, 288 pp

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USSR

UDC 616-002.71-036.2(470)

MATKOVSKIY, V. S., Docent, DMITRIYEV, O. I., Candidate of Medical Sciences, and ISAYEV, Ye. N., Department of Infectious Diseases (Head-Docent V. S. Matkovskiy) Military Medical Academy imeni S. M. Kirov, Leningrad

"New Data on the Spread of "Far Eastern" Scarlatina-Like Fever (Pseudotuberculosis) in the RSFSR"

Abstract: "Far Eastern" scarlatina-like fever is a new infectious disease which was detected in 1957 and identified as a special form of pseudotuberculosis in 1965. The pathogen, Pasteurella pseudotuberculosis Pfeifferi, is transmitted by certain rodents and is contracted by human beings through the gastrointestinal tract. For a long time it was believed that this disease was restricted to the Far East. In February and March 1969, a mass outbreak occurred in several Leningrad kindergartens, involving 78 children aged 4 to 7, as well as eight adult staff members. Because of the diverse symptoms, the illness was variously diagnosed as scarlet fever, tonsillitis, influenza, german measles, and, in one case appendicitis. Since conventional treatment was ineffective, comprehensive epidemiological, clinical, and laboratory investigations were performed, and the disease was finally diagnosed as pseudotuberculosis. The source of the infection was rapidly tracked down. All of the kindergartens affected regularly served raw vegetables purchased
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USSR

MATKOVSKIY, V. S., et al., Sovetskaya Meditsina, Vol 33, No 7, Jul 70, pp 132-135

from the same seller. The storage facilities were inspected and rodents found there were subjected to laboratory tests in which Pasterella pseudotuberculosis was isolated. Since the disease is no longer restricted to the Far East, physicians are urged to be on the alert for it when they observe atypical cases of scarlet fever, German measles, acute appendicitis, or hepatitis.

2/2

USSR   UDC: 621.396.6-181.6(088.8)

DIN'KOV, B. N., YEVTEYEV, F. Ye., SAMARSKAYA, M. K., DMITRIYEV, P. A.,
Leningrad Electrical Engineering Institute imeni V. I. Ul'yanov

"A Device for Atomizing Thin-Film Microcircuits"

USSR Author's Certificate No 259209, filed 12 Jul 68, published 28 Apr 70
(from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12V248)

Translation: A device is proposed for atomizing thin-film micromodules.
The device contains a vacuum chamber with a mechanism for raising the bell,
a drive mechanism for shifting the substrates placed on movable platforms
together with masks, a shielding screen, and a locating plate. To improve
visual observation of the operation of every atomizer, the upper part of
the shielding screen is made in the form of a cylinder equipped with an
observation port covered with a cylinder which is made from a transparent
material and is connected to a drive containing two braking belts which
fit in grooves on a locating ring. On the end of one of these belts is a
carrier which fits into the fork of a bimetallic loop connected to a source
of current, while the other belt wraps around the locating ring to keep it
from turning.
1/1

USSR

UDC 599.323.4:591.95

DMITRIYEV, P. P., Moscow State University

"A Supplementary Method of Estimating the Efficacy of Measures to Control Great Gerbils"

Abstract: The proposed method is based on the fact that gerbil behavior changes significantly when the population density is decreased, especially after poison is used. The surviving animals become very cautious, make no sounds even in the presence of danger, rarely emerge from their burrows, and use only certain openings. The number of such openings, which can easily be counted, becomes a criterion of effectiveness of the extermination measure used, for as the death rate rises, the number of openings steadily decreases. The method is less laborious than counting the number of animals per colony or the number of colonies inhabited.

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USSR   UDC 599.323.4 Rhombomys:591.555

NAUMOV, N. P., DMITRIYEV, P. P., and LOBACHEV, V. S., Moscow State University

"Changes in Biocenoses in the Aral Kara Kum Caused by the Extermination of
Great Gerbils"

Abstract: The effect of the mass extermination of great gerbils in the Aral
Kara Kum desert on the general biocenesis of the area was studied. The obser-
vations were conducted in the period of 1961 to 1967. Seed -- oats and wheat
-- treated with 3% vegetable oil and 15-20% zinc phosphide was scattered
throughout the desert in an area thickly populated with the rodents. The mass
extermination of gerbils was gradually followed by the disappearance of mice,
jerboas, and hamsters and in lesser numbers by disappearance of insectivora and
reptiles. The disappearance of these animals produced a sharp change in the
trophic conditions of the area with the result that the number of all types of
vertebrates and predatory birds gradually diminished. The extermination of
the gerbils and disappearance of other rodents led also to a change in the
structure of the ground: the numerous nests and tunnels dug in the ground by

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USSR

NAUMOV, N. P., et al, Zoologicheskiy Zhurnal, Vol 49, No 12, Dec 70, pp 1758-1766

the rodents gradually collapsed and filled, thereby changing also the vegetation character of the area. As a consequence of the change in the general biocenosis in the area, conditions were created favoring the breeding of herbivorous animals in the Aral Kara Kum desert.

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1/2   021   UNCLASSIFIED   PROCESSING DATE--16OCT70
TITLE--YIELD OF CARBON 11 FROM PRIME9 BE (PRIME3 HE, N) PRIME11 C AND
  PRIME9 BE (ALPHA, 2N) PRIME11 C REACTIONS -U-
AUTHOR-(05)-KRASNOV, N.N., DMITRIYEV, P.P., DMITRIYEVA, Z.P.,
  KONSTANTINOV, I.O., MOLIN, G.A.
COUNTRY OF INFO--USSR

SOURCE--AT. ENERG. 1970, 28(3), 258

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--CARBON ISOTOPE, ION BOMBARDMENT, ALPHA BOMBARDMENT, BERYLLIUM
  ISOTOPE, ION ENERGY, ALPHA SPECTRUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1994/1236   STEP NO--UR/0089/70/028/003/0258/0258

CIRC ACCESSION NO--AP0115253
                         UNCLASSIFIED

CIRC ACCESSION NO--AP0115253
ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT.   THE YIELD OF PRIME11 C IN THE
PRIME9 BE (PRIME3 HE, N) PRIME11 C REACTION INCREASES ALMOST LINEARLY
(0.05-1.60) TIMES 10 PRIME9 DECAYS-(SECMUA HR) WHEN THE PRIME3 HE IONS
ENERGY IS INCREASED 2-30 MEV; THE YIELD OF PRIME11 C IN THE PRIME9
BE(ALPHA, 2N)PRIME11 C REACTION INCREASES FROM 0 TO (0.125-0.75) TIMES
10 PRIME9 DECAYS-(SEC MUA HR) WHEN THE ALPHA PARTICLES ENERGY IS
INCREASED FROM 20 TO 27-44 MEV, RESP.   THE ABOVE YIELDS WERE MEASURED
BY BOMBARDING THE BE IN A CYCLOTRON.

UNCLASSIFIED

1/2   031   UNCLASSIFIED   PROCESSING DATE--23OCT7
TITLE--YIELDS OF FLUORINE 18 DURING THE IRRADIATION OF SODIUM, MAGNESIUM,
 AND ALUMINUM BY HELIUM 3 IONS AND THE IRRADIATION OF SODIUM BY ALPHA
AUTHOR-(05)-KRASNOV, N.N., DMITRIYEV, P.P., DMITRIYEVA, Z.P.,
 KONSTANTINOV, I.O., MOLIN, G.A.
COUNTRY OF INFO--USSR

SOURCE--AT. ENERG. 1970, 28(3), 257

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--FLUORINE ISOTOPE, SODIUM, MAGNESIUM, ALUMINUM, IRRADIATION,
 ALPHA PARTICLE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/1578   STEP NO--UR/0089/70/028/003/0257/0257

CIRC ACCESSION NO--AP0120357
                         UNCLASSIFIED

CIRC ACCESSION NO--AP0120357
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE YIELDS OF PRIME18 F
   (DISINTEGRATIONS-SEC-MU A-HR) FROM PRIME23 NA (PRIME3 HE, 2 ALPHA)
   PRIME19 F AND PRIME23 NA (ALPHA, 2 ALPHA N) PRIME18 F WERE SIMILAR TO E
   TIMES 10 PRIME6 AT SIMILAR TO 27.5 MEV AND SIMILAR TO 55 TIMES 10 PRIME
   AT SIMILAR TO 44 MEV, RESP. FOR PRIME24 MG (PRIME3 HE, 2 ALPHA N)
   PRIME18 NE YIELDS PRIME18 F, THE YIELD WAS SIMILAR TO 5 TIMES 10 PRIME6
   AT SIMILAR TO 28 MEV AND FOR PRIME27 AL (PRIME3 HE, 3 ALPHA) PRIME18 F.
   IT WAS SIMILAR TO 2.5 TIMES 10 PRIME6 AT 29.5 MEV.

UNCLASSIFIED

USSR   UDC 599.32-12:616.981.452-036.22(252-925.2)

NAUMOV, N. P., LOBACHEV, V. S., DMITRIYEV, P. P., KANATOV, Yu. V., and
SMIRIN, V. M., Moscow State University and Central Asian Antiplague Institute

"Experience in Studying the Dispersal Rate and Paths of Movement of Plague
Epizootics in the Northern Desert"

Abstract: Microbiological, immunological, and ecological data were employed
to trace the paths and rates of plague epizootic dispersal northward across
a front of over 200 km east of the Aral Sea in 1966-1969. Data were obtained
for the most part from Rhombomys opimus Licht. and its parasites. Presence
of animals with acute manifestations of plague and incomplete antibodies was
assumed to suggest a new invasion. Prior to the period of investigation,
plague foci were noted only on the outskirts of this territory following a
rodent and ectoparasite eradication program conducted in 1958. In the spring
1966 northward dispersal began from foci just north of the Syr-Dar'ya River.
Most progress occurred during 5 months of summer and fall and ranged from 15 to
50 km per year. By fall 1969 the epizootic became stabilized somewhat. For-
ward progress was stalled in areas that had been subjected to one-time eradica-
tion programs, but it was not entirely arrested. The radial dispersal of the

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epizootic that was revealed suggests that the disease is spread predominantly through the dispersal of young R. opimus. This research demonstrates that epizootics can be traced reliably by direct observation in the field.

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USSR   UDC 619:616.988.73:636.5

TSIRO, V. A., Candidate of Veterinary Sciences, DMITRIYEV, P. V., KIR'YANOV,
YE. A., and DENISENKO, R. A., Veterinary Physicians

"Bird Ornithosis Outbreak"

Abstract: Up to 120 different species of wild birds and farm poultry can
contract ornithosis. Migrating birds transmit the disease to poultry. In
the Soviet Union, the ornithosis pathogen was first detected in 1948. However,
the disease was first recorded among human beings in 1969: personnel in a'
poultry combine were infected by sick ducks. These ducks had been in con-
tact with pigeons inhabiting the farm and with water fowl inhabiting the
neighboring lakes. Bacteriological and virological tests performed on the
blood serum and on internal organs of the dicks, pigeons, and water fowl
revealed an absence of bacteria and the presence of ornithosis virus.
Veterinary therapeutic and preventive measures were taken immediately. The
disease was eradicated, and no cases of ornithosis have been recorded since
then.

1/1

USSR   UDC: 621.316.933

DMITRIYEV, S. P., RODICHKIN, V. A., TIMONIN, A. M.

"A Multichannel Spark Discharger"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki,
No 7, Mar 72, Author's Certificate No 329616, Division H, filed 30 Jun 70,
published 9 Feb 72, p 213

Translation: This Author's Certificate introduces a multichannel spark
discharger which contains a one-piece solid electrode, and an electrode
with holes accommodating ignition electrodes. As a distinguishing feature
of the patent, operational reliability is improved by placing auxiliary
electrodes between the main electrodes. Each of the auxiliary electrodes
is connected by two wires to the solid electrode at points located on the
axes of adjacent auxiliary electrodes.
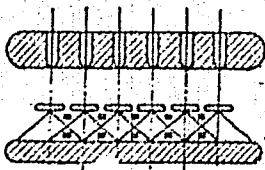
1/1

USSR   UDC: 681.128.3

AUZHBIKOVCIH, A. M., DMITRIYEV, S. P., ZARITSKIY, V. S., Leningrad Insti-
tute of Aviation Instrument Building

"A Two-Component Fuel Gauge"

Translation: This Author's Certificate introduces a two-component fuel
gauge containing a fuel-metering tank, a vaned-wheel flowmeter, a com-
parator, a computer device based on functional modules, and an indicator.
As a distinguishing feature of the patent, measurement accuracy is improved
by connecting the integrator in the computer device through an inertial
link to the fuel-meter signal comparator. The output of the comparator is
connected through a correcting link to one of the outputs of an adder in
the computer device. The fuel meter and flowmeter are connected to the
inputs of the comparator and adder respectively.

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USSR

ABROSIMOV, N. K., ALKHAZOV, D. G., DMITRIYEV, S. P., YELISEYEV, V. A., KAMINKER, D. M., KULIKOV, A. V., MIRONOV, Yu. T., MIKHEYEV, G. F., RYABOV, G. A., CHERNOV, N. N., SHALMANOV, V. I., KOMAR, Ye. G., MALY-SHEV, I. F., MONOSZON, I. A., PEREGUD, V. I., ROZHDESTVENSKIY, B. V., ROYFE, I. M., SEREDENKO, Ye. V., Physicotechnical Institute imeni A. F. Ioffe, Academy of Sciences of the USSR, Leningrad, Scientific Research Institute of Electrophysical Equipment imeni D. V. Yefremov, Leningrad

"The Leningrad Synchrocyclotron for a Proton Energy of 1 GeV"

Abstract: The paper describes the synchrocyclotron at the Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences of the USSR for a proton energy of 1 GeV. Proton beam parameters as well as the characteristics of the main systems of the accelerator are presented. The beam channels are described, and the layout of the accelerator building is given. The installation has been in successful operation since 1970. Three tables, two figures, bibliography of twelve titles.

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USSR   UDC 621.384.6

ABROSIMOV, N.K., DMITRIYEV, S.P., KULIKOV, A.V., MIKHEYEV, G.F., SEREDENKO,
YE. V., CHERNOV, N.N. [Fiz.-tekhn. in-t AN SSSR -- Physicotechnical Institute,
AS USSR]

"Device For Coupling An Oscillator Tube With The Resonance System Of A Synchro-
cyclotron"

USSR Author's Certificate No 270131, filed 28 Apr 69, published 5 Aug 70 (from
RZh--Elektronika i yeye primeneniye, No 2, February 1971, Abstract No 2A403P)

Translation: A device is proposed for coupling an oscillator tube with the
resonance system of a synchrocyclotron, which contains a waveguide feeder line.
With the object of increasing the reliability of excitation of the resonance
system and suppressing the transverse oscillations at the dee, the feeder for
direct coupling is fulfilled in the form of two branches connecting the tube
anode with the right and left halves of the dee, symmetrically with respect to
the longitudinal axis of the dee, and the voltage feedback to the tube cathode
is fed across a branching feedback feeder with the inductive voltage divider
also arranged symmetrically with respect to the longitudinal axis of the dee at

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USSR

ABROSIMOV, N. K., et al., USSR Author's Certificate No 270131, filed 28 Apr 69, published 5 Aug 70

its end opposed to the accelerating slit. In a variation of the proposed device, with the object of obtaining a relatively steady transmission of voltage from the anode of the oscillator tube to the accelerating slit of the dee, a lumped capacitance is connected to the anode of the oscillator tube, and the length and wave resistance of the feedback feeders are respectively matched.

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USSR

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PAUSHKIN, YA. M., PANCHENKOV, G. M., CHERNYKH, V. G., LUNIN, A. F., KAUSHANSKIY, D. A., DMITRIYEV, V. A., and MARKOVICH, V. B., Moscow Institute of the Petrochemical and Gas Industry imeni I. M. Gubkin, Moscow, Ministry of Higher Education USSR

"Effect During the Process of Irradiation of Ionizing Radiation on Polymers With Conjugated Bonds"

Abstract: The effects of gamma-rays from ^{60}Co at a dosage rate of 1.2-1.3 Mrad/hr on the electrophysical properties of the organic semiconductors polyacetonitrile (I), paracyanogen (II), polyphenyl-cyanamide (III), polydiacetyl (IV), polybutylcyanamide (V), and polybutylcyanate (VI), specifically on their electrical resistance, were studied during the process of irradiation. For I, II, IV, and VI with a low ohmic resistance that were prepared at $450-500^\circ$, irradiation at doses $\leq 5 \times 10^9$ rad did not result in any changes of resistance. Irradiation of V, which also had a low ohmic resist-ance, produced a slow rise in resistance in the dose range of 0-110

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USSR

Mrad and an abrupt rise at 110-140 Mrad. In the case of VI with a high ohmic resistance, which was prepared at $350°$, ionizing radiation in the dose range from 0 to 170-200 Mrad produced further polymerization and cross-linking, which were reflected in a decrease of the resistance, while doses $>$ 200 Mrad decomposed the polymer. The results showed that irradiation at doses up to 5×10^9 rad of I, II, IV, and VI with a low ohmic resistance did not change the physico-chemical and electrophysical properties of these polymers - i.e., they are suitable for use in radioelectronic devices operating under conditions of exposure to ionizing radiation.

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USSR   UDC: 621.373.531.3(088.8)

KONRADI, L. G., DMITRIYEV, V. A., PUZYREVICH, Yu. S.

"A Sawtooth Voltage Generator"

USSR Author's Certificate No 266832, filed 28 Mar 69, published 2 Jul 70
(from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1G280 P)

Translation: This Author's Certificate introduces a sawtooth voltage
generator which contains a transistorized flip-flop and two resistance-
-capacitance charging networks. For separate regulation of the durations
of sawtooth voltage pulses and the pauses between them, the outputs of the
resistance-capacitance networks are connected through semiconductor
switching diodes to the inputs of the flip-flop, and through separative
semiconductor diodes to the collectors of the flip-flop transistors.

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TITLE--EFFECT OF A STOICHIOMETRIC DEVIATION ON THE CRYSTAL STRUCTURE OF
CADMIUM SELENIDE THIN FILMS -U-

AUTHOR-(04)-SHALIMOVA, K.V., DMITRIYEV, V.A., ROGGE, K., BOTNEV, A.F.

COUNTRY OF INFO--USSR

SOURCE--KRISTALLOGRAFIYA 1970, 15(2), 342-5

DATE PUBLISHED------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--CADMIUM SELENIDE, METAL FILM, METAL VAPOR, SELENIUM, THERMAL
EFFECT, CRYSTAL STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1569   STEP NO--UR/0070/70/015/002/0342/0345

CIRC ACCESSICN NO--AP0125195
                          UNCLASSIFIED

CIRC ACCESSION NO--AP0125195
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF STOICHIOMETRY ON THE
CRYSTAL STRUCTURE OF CDSE FILMS, 0.1-3 MU THICK, EVAPD. IN VACUO ONTO
GLASS SUBSTRATES AT 90-455DEGREES WAS STUDIED. THE INFLUENCE OF THE
HEAT TREATMENT IN CD OR SE VAPORS, AT 250-450DEGREES, AND THE
SIMULTANEOUS EVAPN. OF CDSE PLUS SE OR CDSE PLUS CD ON THE FILM
PROPERTIES WAS ALSO STUDIED; EXCESS CD AND SE CAUSES THE FORMATION OF
THE HEXAGONAL AND CUBIC PHASE, RESP. OPERATING CONDITIONS ARE GIVEN FOR
THE PRODUCTION OF THE SINGLE PHASE FILMS.   FACILITY: MOSK.
ENERG. INST., MOSCOW, USSR.

UNCLASSIFIED

TITLE--CRYSTAL STRUCTURE OF ZINC OXIDE OBTAINED BY OXIDIZING ZINC SULFIDE
   THIN FILMS -U-

AUTHOR-(03)-SHALIMOVA, K.V., SATYBAYEV, N.M., DMITRIYEV, V.A.

COUNTRY OF INFO--USSR

SOURCE--KRISTALLOGRAFIYA 1970, 15(1), 200-I

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, MATERIALS, PHYSICS

TOPIC TAGS--ZINC SULFIDE, ZINC OXIDE, SOLID SOLUTION, CRYSTAL STRUCTURE, X
   RAY DIFFRACTION, ELECTRON DIFFRACTION, VAPOR CONDENSATION, VACUUM
   DISTILLATION, VACUUM SUBLIMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/0517   STEP NO--UR/0070/70/015/001/0200/0201

CIRC ACCESSION NO--AR0119437
                         UNCLASSIFIED

CIRC ACCESSION NO--AR0119437
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CHANGES IN THE ZNS THINFILM
STRUCTURE WERE STUDIED BY ELECTRON AND X RAY DIFFRACTION.   THE MAX.
TEMP. WAS SOUGHT FOR WHICH ZNS (THICKNESS 1.0 MU, PREPED. BY VACUUM
CONDENSATION) IS NOT OXIDIZED IN AIR. BY HEATING AT 550-600DEGREES FOR
1 HR, THE FORMATION OF A ZNO FILM OF HEXAGONAL MODIFICATION WITHOUT ANY
ORIENTATION WAS OBSD. ON THE SURFACE OF THE ZNS. AFTER 4 HR AT
600DEGREES OR 2 HR AT 650DEGREES, COMPLETE OXIDN. OF THE ZNS WAS OBSD.;
THE CRYSTALS OF ZNO FORMED WERE ORIENTED PARALLEL TO THE (0001) PLANE OF
THE SUBSTRATE.   ZNS-ZNO SOLID SOLNS. WERE NOT OBSD.   FACILITY:
MOSK. ENERG. INST., MOSCOW, USSR.

UNCLASSIFIED

BYKOV, V. N., VAKHTIN, A. G., DMITRIYEV, V. D., KOSTROMIN, L. G.,
LADYGIN, A. YA. and SHCHERBAK, V. I.

"Radiation Swelling of OKh16N15M3B Steel"

Abstract: Results are presented from electron-microscope studies of
radiation porosity in OKh16N15M3B steel bombarded by neutrons in the
BR-5 reactor. The specimens used were discs 3.5 mm in diameter and
0.4 mm thick, cut from various sections of fuel element shells follow-
ing bombardment in the BR-5 reactor to integral fluxes of $4.3 \cdot 10^{22}$ neu-
trons per square centimeter in the 430-580° C interval. After manufac-
ture, the fuel element shells were annealed at 950° C for 10 minutes
in a vacuum. The dependence of swelling on integral dose and tempera-
ture of bombardment is constructed. The dependence is exponential in
nature, with an exponent of 1.5, which is slightly less than that de-
termined for type 316 steel. The maximum calculated swelling of the
steel with a flux of 10^{23} neutrons per square centimeter is 6-7%.

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USSR

UDC 535

DMITRIYEV, V. D.

"On the Theory of Thermal Radiation of Metals"

V sb. Teplofiz. svoystva tverd. veshchestv. (Thermophysical Properties of Solids -- Collection of Works), Moscow, "Nauka", 1971, pp 116-121 (from RZh-Fizika, No 7, Jul 71, Abstract No 7D952)

Translation: A theoretical study of the interaction of photons with a system of electrons subject to Fermi-Dirac statistics is presented. A function for the thermal radiation of metals is obtained on the basis of considering electron transitions and the Pauli principle which consists of the product of the Fermi distribution function and the Planck function for black body radiation. It follows from the theory that the characteristic frequency corresponds to electron energy at the Fermi level, and the ray emission capacity at this wavelength should be equal to one-third for all metals. Authors abstract.

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UNCLASSIFIED   PROCESSING DATE--13NOV70
TITLE--IMPROVING THE QUALITY AND ECONOMICS AND REDUCING SCRAP RETURNS IN
THE PRODUCTION OF STEEL SHEET -U-

AUTHOR--DMITRIYEV, V.D.

COUNTRY OF INFO--USSR

SOURCE--METALLURG, MAR. 1970, (3), 29-30

DATE PUBLISHED----MAR70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--STEEL SCRAP, ROLLING MILL, STEEL PLANT, ECONOMICS, HIGH
QUALITY STEEL, STEEL SHEET, SHEET METAL, KILLED STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/0862   STEP NO--UR/0130/70/000/003/0029/0030

CIRC ACCESSION NO--AP0124525
                        UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0124525

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CHANGES IN TECHNOLOGICAL
CONDITIONS LEADING TO A SUBSTANTIAL IMPROVEMENT IN THE QUALITY OF KILLED
STEEL SHEET IN A LARGE METALLURGICAL FACTORY ARE DESCRIBED. THUS
MODIFICATIONS TO THE HEATING CONDITIONS ELIMINATE LOCAL OVERHEATING AND
CONSEQUENT LOSS OF METAL, CHANGES IN THE MECHANICAL PARTS OF THE ROLLING
MILL LEAD TO A GREATER ALL ROUND EFFICIENCY AND A MORE EVEN FLOW OF THE
METAL, AND (MOST IMPORTANT) A CHANGE IN THE CONFIGURATION OF THE
ORIGINAL BILLETS LEADS TO A GREATER ANNUAL OUTPUT AND A REDUCTION IN
WASTAGE. THE POSSIBLE WIDER INTRODUCTION OF THESE MODIFICATIONS IS
CONSIDERED.

UNCLASSIFIED

USSR

UDC: 621.398

DMITRIYEV, V. F., Candidate of Technical Sciences, and KOL'CHIK,
A. D., NEDIL'KO, A. F., Engineers

"Experiences in the Installation and Operation of the TM-100
Remote Control System"

Abstract: Details of the installation and operation of the new re-
mote control system TM-100, designed by the TsNIIKA (State All-
Union Central Scientific Research Institute of Complex Automation)
and NIPINeftekhimavtomat (Scientific Research and Planning Insti-
tute for Complex Automation of Production Processes in the Petro-
leum and Chemical Industries) in 1966. The system prototype was
built in 1968 by the ZTA (Plant for Remote Control Equipment),
underwent interdepartmental testing, and was put into production.
This equipment provides the answer of these principal technical problems: a
duplex method for transmitting signals in a communication channel using standard
telegraphic channel-forming equipment; a combination of highly effective message
safeguards and synchronous operation independent of noise; constant control of
communications channels and such system devices as output remote control units
1/2

USSR

DMITRIYEV, V. F., et al., Pribory i Sistemy Upravleniya, No 9, 1973, pp 19-21

with no false command outputs; economy in reproducing information through the
use of memory systems; and automatic self-modifying programs for command output
in an emergency situation. Photographs of the system control desk and the
receiver-transmitter UPP-KP assembly are produced, and a summary of the results
obtained from installation is given, together with some relevant technical
specifications.

2/2

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USSR   UDC 621.398

PSHENICHNIKOV, A.M., DMITRIYEV, V.F., KHAZATSKIY, V.E., Candidates of Tech-
nical Sciences, and KLIMENKO, V.I., Engineer

"New Telemechanical Systems for Constructing Information and Control Systems"

Abstract: Two series of telemechanical systems have been developed under the
leadership of TsNIIKA [State All-Union Central Scientific Research Institute
of Complex Automation] to transmit data and commands among physically separ-
ated facilities: the Nart-67 series and APD series. Nart-67's serve continu-
ous-output control systems; APD's, discrete output.
     In the Nart-67 series the TM-100, serving relatively slow processes (dis-
patcher control of pipelines, gasfields, irrigation systems), connects a con-
trol post with up to 20 check points. Transmitting speed is 50 bauds. Two
parameters are sent per second in cyclic telemetry. Telesignalization lag
when an installation's status changes does not exceed 25 seconds. Remote con-
trol commands are sent in 4 seconds. Range is up to 2,000 km. Basic telemetry
error equals 1.6 percent. Probability of receiving a false message is 10^{-8};
a command, 10^{-12}. The TM-100 is made at the ZTA [Telemechanical Apparatus
Plant] at Nal'chik.

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USSR

PSHENICHNIKOV, A.M., et al., Moscow, Pribory i Sistemy Upravleniya, No 12, Dec 1970, pp 1-3

The TM-300, serving intensive industries, such as mining, metallurgy, and chemicals, connects a control post with up to 25 check points over two-wire line at distances up to 220 km. Telemetry transmission speed is 25 parameters per second; telesignalization is sent in 0.6 second, remote control commands in 0.3 second; basic telemetry error is 1.6 percent for digital, 2.5 percent for analog data. The TM-300 is produced at the ZTA.

The TM-500, which provides a higher degree of dispatcher control to power associations at unlimited range, connects the control post with check points by high-frequency multiplexing. Time for sending telemetry and telesignalization at 50 bauds is 4 seconds, or 0.7 second at 300 bauds. Switching to a backup channel is automatic. The TM-500 prototype was made under the code name "Stimul" at the TsNIIKA Experimental Plant. Many Stimul sets are used in the power system to good economic effect.

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USSR

PSHENICHNIKOV, A.M., et al., Moscow, Pribory i Sistemy Upravleniya, No 12, Dec 70, pp 1-3

The TM-200 (Rayon), developed at the Automation Institute (Kiev), provides regional dispatcher control of pipelines, irrigation systems, and municipal services.

The TM-600 (Nefte), which serves dispersed gasfields, was developed by research and planning institutes which specialize in complex automation of the petroleum and gas industries.

APD equipment comprises four groups, each meeting a different type of need.

With the first APD series, discrete production data is collected in departments or shops and transmitted, preferably by keyboard, to a post where it is concentrated and given initial processing. Data transmitting speed can vary from 3 to 7 characters per second. Data is sent over nonmultiplexed wire lines at distances up to 15 km. Validity ordinarily is no greater than 10^{-5} per character.

With the second APD series, automatically prepared data is sent from point of initial collection and processing over telephone or telegraph lines to the

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USSR

PSHENICHNIKOV. A.M., et al., Moscow, Pribory i Sistemy Upravleniya, No 12, Dec 70, pp 1-3

computing centers of large combines, dispensing with the need for small, ineffective computing centers. Transmitting speed is 5-8 characters per second by telegraph, 15-25 or 80-120 by telephone line. Either commutated or noncommutated lines can be used. The data should go directly into the computer or, in case of computer outage, onto punched tape. Validity of not less than 10^{-6} per character is required.

The third APD group exchanges data among computing centers, allowing better use of the computer pool and raising reliability. Two types of equipment can be involved, depending on the amount of machine time spent on raising reliability. Speeds of 100-140 or more characters per second and validity of not less than 10^{-7} per character are required.

The fourth APD group, intended for mass servicing (such as automated sales of train or plane tickets, data-handbook service), works with a computer in real time on a question-and-answer mode, using either telephone or telegraph lines. Validity is similar to that of the second APD group.

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USSR

PSHENICHNIKOV, A.M., et al., Moscow, Pribory i Sistemy Upravleniya, No 12, Dec 70, pp 1-3

The APD-MM, for example, belonging to the third APD group, connects BESM-4 computers. "Shuffling" with steps equal to word length reduces the machine time required to raise validity (no more than 2 percent). The Hamming Code is used to detect and correct errors.

The APD-3M is intended for radial communication with computers where data volume is small. Transmission speed is 80-120 characters per second, modulation speed is 1200/600 bauds. Validity is 10^{-6} per character where message distortion probability is 10^{-3}. It has decision feedback.

The APD-1U, intended for mass servicing, works in real time in a question-and-answer mode and has decision feedback characterized by identical speeds in a semiduplex channel. Message protection is provided, ensuring validity of 10^{-7} per character. Speed is 1200/600 or 50/75 bauds.

5/5

AA 0044784‾   DMITRIYEV   V·F. UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

2/70

243014 CIRCUIT FOR VERIFYING SIGNALS. A signal
incoming on the rail (9) to the receiving/
transmitting module (1) is memorized in (2)
decoded in (3) and amplified by (4). The coder
(6) returns to the receiving module a signal which
should be identical to that being verified. The
signals are compared at a control point (external)
and a coded message is despatched to the comparison
module (7) for another check. If everything is
all right the relay (8) operates and one of the
amplifiers (5) issues a signal for operating a
required piece of apparatus.

28.2.68 as 1222288/18-24.N.K.ARKHIPOVA et al.
CENTRAL INST.OF COMPLEX AUTOMATION.(23.9.69.)
Bul 16/5.5.69. Class 21c, 74b. Int.Cl.G 05f,
G 08c.

1|2‾

4.

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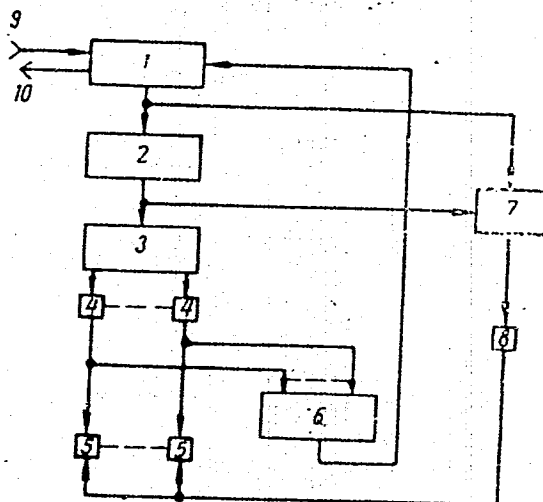
AUTHORS: Arkhipova, N. K.; Dmitriyev, V. F.; Shapovalova, O. K.
Tsentral'nyy Nauchno - Issledovatel'skiy Institut Kompleksnoy
Automatizatsii

2/2

19771598

USSR

UDC: 621.373:530.145.6

DMITRIYEV, V. G., YERSHOV, A. G., ZUDKOV, P. I., SHARIF, G. A., SHVOM, Ye. M.

"Emission of Optical Harmonics in the Pulse Mode With a High Pulse Repetition Frequency"

Translation: The paper presents the results of an experiment on generation of the second, third and fourth optical harmonics of emission from an aluminum--yttrium garnet laser with neodymium working in the pulse mode with Q-switching at a high pulse repetition frequency. It is noted that the intensity of ultra-violet emission on a wavelength of 266 millimicrons is extremely stable. One illustration, one table, bibliography of eight titles. Resume.

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USSR

UDC 621.375.82

DMITRIYEV, V. G., YERSHOV, A. G., ZUDKOV, P. I., SHARIF, G. A., SHVOM, Ye. M.

"Generation of Optical Harmonics in a Pulsed Mode With a High Pulse Repetition Frequency"

Translation: The generation of second, third, and fourth optical harmonics of the radiation of a YAG:Nd laser operating in a pulsed mode with Q-modulation with a high pulse repetition frequency was investigated experimentally. There was found a high stability of ultraviolet radiation intensity at the wavelength 266 nm. Authors abstract.

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USSR

UDC 621.375.82

DMITRIYEV, V. G., KUSHNIR, V. R., RUSTAMOV, S. R., and FOMICHEV, A. A.

"Optimization of the Parameters of Alumino-Yttrium Garnet Lasers With Neodymium in a Quasi-Continuous Generation Mode With a Nonlinear Element Inside the Resonator"

V sb. Kvant. elektronika (Quantum Electronics -- Collection of Works), No 2, Moscow, "Sov. radio," 1972, pp 111-112 (from RZh-Fizika, No 10, Oct 72, Abstract No 10D908)

Translation: The results of experiments on the optimization of an alumino-yttrium garnet laser with Nd under transformation of its radiation to the second harmonic in a nonstoichiometric lithium metaniobate crystal which was placed inside the resonator are presented. The operating mode of the resonator was quasi-continuous. So-called 100% transformation was obtained for an average power of the basic radiation of 310 mw. The peak powers of the basic radiation in the harmonic were 370 and 500 w. 8 ref. Authors abstract.

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USSR

GERASIMOV, S. P., and DMITRIYEV, V. I.

"A Device for Transmitting Frequency Telemechanical Information"

Moscow, Otkrytiya izobreteniya promyshlennyye obraztsy tovarnyye znaki, No 23, 23 May 73, p 216

Translation: (11)228755(21)1193113/18-24(22)25.10.67(51)G 06c 11/00;G 08c 13/00 (53)621.398:654.94(71) Moscow Power Institute

A device for transmitting frequency telemechanical information containing a flipflop, a cycle generator, a 1's recording unit and a control unit, a shift register, a binary counter, and a low-frequency filter is distinguished by the fact that the stability of sinusoidal oscillations is improved by connecting the flipflop input to the output of the binary counter connected with the inputs of the shift register and the control unit, while the flipflop output is con-nected through the low-frequency filter to the communication channel.

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USSR   UDC 621.35.082.75

GAL'PERIN, T. B., DMITRIYEV, V. I., and STRIZHEVSKIY, I. V., Academy of
Communal Farming imeni K. D. Pamfilov, Moscow

"Theory of Rectification in the Electrolytic Cell with a Diffusion Barrier"

Abstract: In the previous paper .. the phenomenon of valve effect /rectification/
has been shown to occur in a dielectrode electrolytic cell after introduction
of a diffusion barrier between the electrodes. A diffusion barrier is con-
sidered to be a border hampering the diffusion process but exhibiting no
selective properties. In this paper mathematical treatment of the theory
of this phenomenon is undertaken.

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USSR

UDC 621.317.7.087.92-932

DMITRIYEV, V. I., IVANOV, I. N., TIMOFEYEV, G. A.

"Convertors of Pulse Repetition Frequency to Direct Current"

USSR Author's Certificate No 293296, Filed 23/04/66, Published 18/03/71, (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychis- litel'naya Tekhnika, No 11, 1971, Abstract No 11 A188 P).

Translation: This invention can be used in measuring systems and automatic regulation systems containing sensors with a frequency output signal. A de- vice is known which converts a frequency to a direct current, containing a dosing condensor connected to the switch of a circuit which limits the charge and with charging and discharging circuits of the condensor, one of which includes an integrating condensor and a parallel load resistor connected to it. The purpose of the invention is to increase the accuracy and speed of this device, eliminate the dependence of the output current on load resistance, increase the maximum power transmitted to the load, and produce an output signal con- sisting of a direct current voltage, regardless of the load impedence. This purpose is achieved by connecting a threshold element to the integrating con- densor, connecting one input of a phase-sensing element to the output of the threshold device, connecting the second input to the output of the entire de- vice, and connecting the output of the phase-sensing element through a

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resistor to the integrating condensor. In order to produce a linear functional characteristic, an amplitude comparater is used as the threshold element, the second input of which is connected to the output of the phase-sensing element through a feedback circuit. 1 Figure.

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USSR   UDC: 681.327.11

DMITRIYEV, V. I., IVANOV, A. V., Moscow Power Engineering Institute

"A Device for Correcting Errors in Parallel Readout of Binary Information"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki,
No 4, Feb 71, Author's Certificate No 292175, Division G, filed 3 Nov 69,
published 6 Jan 71, p 135

Translation: This Author's Certificate introduces a device for error cor-
rection in parallel readout of binary information. The device contains a
reproduction module, a circuit for mod-2 contraction along a line, adders
and buffer shift registers. As a distinguishing feature of the patent, the
design is simplified and error correction is made more effective by using a
circuit for mod-2 contraction along the diagonal, AND and NOT logic circuits
and memory cells. The input of the first memory cell is connected through
the AND and NOT logic circuits to the output of the circuit for mod-2 con-
traction along a line, and the output of each memory cell is connected to one
of the inputs of the AND circuits. The second inputs of the AND circuits
are connected to the output of the circuit for mod-2 contraction along the
diagonal. The outputs of the AND circuits are connected to one of the inputs
of the adders, and simultaneously through the NOT circuits to the inputs

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USSR

DMITRIYEV, V. I., IVANOV, A. V., USSR Author's Certificate No 292175

of the other AND circuits, which are connected to the outputs of the preceding
memory cells, whose outputs are connected to the inputs of the following
memory cells. The other inputs of the adders are connected to the corre-
sponding inputs of the circuit for mod-2 contraction along the diagonal.

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USSR

UDC 621.371

DMITRIYEV, V. I., KOROLEVA, K. P., SKUGAREVSKAYA, O. A., and
FEDOROVA, E. A.

"Investigating the Electromagnetic Field of an Electric Dipole in
the Presence of Powerful High-Resistance Layers in the Earth"

Translation: Computation of the field with powerful high-resistance
layers in the earth involves a great deal of difficulty, caused by
the need for computing integrals in the Hankel inverse transform.
For this purpose, a calculating algorithm is developed by which
the function under the integral sign is approximated in the low-
frequency region with the required degree of accuracy. For the
high-frequency region, where the required degree of accuracy can-
not be attained, asymptotic formulas are obtained for making the
calculations with the presence of the layers taken into account.
Three illustrations, bibliography of two. N. S.
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USSR   UDC:621.313.12:539.172.12

BOL'SHOV, V. I., DUBININ, A. A., DMITRIYEV, V. M., KAPCHIGASHEV,
S. P., KON'SHIN, V. A., MATUSEVICH, YE. S., POLIVANSKIY, V. P.,
PUPKO, V. Ya., REGUSHEVSKIY, V. I., STAVISSKIY, Yu. Ya., and
YUR'YEV, Yu. S.

"Physical Investigation of the Target in an Electronuclear
Neutron Flux Generator"

Abstract: Fluxes of thermal neutrons on the order of $10^{17} - 10^{18}$
$n/cm^2 \cdot sec$ open new possibilities for investigations in many
areas of science and technology. There is great interest in
the study of the possibility for increasing neutron fluxes by
using the process of multiple neutron birth upon interaction
of nucleons with energies in the hundreds of MeV with heavy
nuclei. This article presents the results of experiments and
calculations concerning the neutron-physical characteristics

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USSR

BOL'SHOV, V. I., DUBININ, A. A., DMITRIYEV, V. M., KAPCHIGASHEV,
S. P., KON'SHIN, V. A., MATUSEVICH, Y. E. S., TOLIVANSKIY,
V. P., TUPKO, V. Ya., REGUSHEVSKIY, V. I., STAVISSKIY, Yu. Ya.,
YUR'YEV, Yu. S., Moscow, Atomnaya Energiya, Vol 28, No 5, May
70, pp 388-392

of the target in an electronuclear device for the generation
of neutron fluxes. The yield of neutrons and distribution of
the number of reactions in a heavy target and moderator are
measured. The space-energy distribution of neutron flux in
the moderator is calculated and the accumulation of transuranium
elements in a system with high neutron flux is computed.

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USSR   UDC 537.312.62

KONOVODCHENKO, V. A., DMITRIYEV, V. M., KOMAREVSKIY, S. K., LOKTIONOV, N. F.

"Nonisothermal Superconducting Bolometer. II"

Tr. Fiz.-tekhn. in-t nizk. temperatur AN USSR (Works of the Physico-Technical
Low Temperature Institute of the Ukrainian SSR Academy of Sciences), 1970,
vyp. 9, pp 72-84 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract 4D463)

Translation: The concept of creating a nonisothermal superconducting bolo-
meter arises directly from the statement of the problem of thermal conduc-
tivity for an ordinary (isothermal) superconducting bolometer considering non-
uniformity of the temperature distribution along its sensitive element. How-
ever, along with the useful effect used, the understanding of the fact of
simultaneous existence of sections with different superconducting states in
the sensitive element of the superconducting bolometer implies significant
complication of the problem which in this statement is very simple for
ordinary bolometers. In some practical cases the sections of the sensitive
element in the intermediate state make an insignificant contribution to its
total electrical resistance, and analysis of the operation of the supercon-
ducting bolometer can be greatly simplified if only its superconducting and

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USSR

KONOVODCHENKO, V. A., et al., Tr. Fiz.-tekhn. in-t nizk. temperatur AN USSR, 1970, vyp. 9, pp 72-84

normal sections are considered. This problem was investigated earlier by the authors. This paper is devoted to solving the most general stationary problem of thermal conductivity of nonisothermal superconducting bolometers and development of a method of graphoanalytical investigation of its character- istics. A system of equations for determining the current coordinates of the boundaries of the sections of the superconducting bolometer with different states of the superconductor was obtained as a result of solving this problem. A number of special cases of solving the system are investigated, which along with having independent value, also turn out to be very useful when writing and developing the program for its complete solution. There are 2 illustra- tions and a 4-entry bibliography.

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USSR   UDC: 621.375.029.64

MENDE, F. F., PRENTSLAU, N. N., and DMITRIYEV, V. M.

"UHF Amplifier With Internal Negative Feedback"

Moscow, Radiotekhnika, No 2, 1972, pp 69-75

Abstract: In this paper, the authors propose an improvement to a
system they offered in an earlier paper (F. F. Mende, et al, Pri-
bory i tekhnika eksperimenta, No 3, 1967). The earlier system was
a frequency-stabilizing device using a uhf amplifier with inter-
mediate frequency amplification and amplitude modulation. While
the amplifier had good phase characteristics and high gain, the
amplitude modulator limited the output signal since it was not
designed for high power at the high modulation frequencies. The
uhf amplifier offered in the present paper uses frequency modula-
tion of the reference oscillator and has no amplitude modulator,
thus avoiding the defect of the former model. A block diagram of
the device is given and its operation is explained. Basic design
expressions are developed. The new device was experimentally

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USSR

MENDE, F. F. et al, Radiotekhnika, No 2, 1972, pp 69-75

tested; it was equipped with a reflex klystron operating at 17-20 MHz and an intermediate frequency of 10 MHz. Curves for experimental and theoretically derived data are shown. The authors express thanks to M. B. Golant, M. S. Khaykin, and R. T. Mina.

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USSR   UDC: 8.74

ABAYS, Ye. A., DMITRIYEV, V. M.

"Program for Modeling and Analysis of Radio Electronic Circuits (MARS-1)"

V sb. Vopr. programmir. i avtomatiz. proyektir. (Problems of Design Pro-
gramming and Automation--collection of works), Tomsk, Tomsk University,
1971, pp 65-79 (from RZh-Kibernetika, No 1, Jan 72, Abstract No 1V1065)

Translation: The authors describe principles and algorithms for analyzing
the characteristics of AC and DC circuits, including algorithms for cal-
culating sensitivity and finding the frequency responses of the circuits,
and statistical analysis of electronic circuits. A. Doroshenko.

1/1

"Program f..

V sb. Vopr. progra...
gramming and Automation---collection of works), Tomsk, Tomsk University,
1971, pp 44-64 (from RZh-Kibernetika, No 1, Jan 72, Abstract No 1V1066)

UDC: 8.74

...onic Circuits (MARS-1)"

...provektir. (Problems of Design Pro-

Translation: A program is described for modeling and analysis of elec-
tronic radio circuits by means of a computer designed to aid the planner
with the analytical part of his work. The basic purpose of the program
is to predict the behavior of an electronic circuit modification selected
by the designer on the basis of its mathematical model. The program pro-
vides for: 1) analyzing electronic circuits in the constant and steady-
-state mode; 2) analyzing transient processes in the circuit; 3) carrying
out various statistical studies (evaluating the effect of scatter in
parameters and aging of elements, analyzing circuit reliability, analyzing
the sensitivity of the circuit to variations in its internal parameters).
In addition to circuits with DC signals, the program can be used for ana-
lyzing circuits whose supply source is a trapezoidal pulse, a sinusoidal

1/2

Devices

Abstract: Two types of discriminator in which the error signal is at the
intermediate frequency are proposed, the authors claiming for them freedom
from difficulties encountered with such discriminators suggested by earlier
work. The first circuit uses a parallel connection of the amplitude modulator
and the standard resonator, such that the signal from the tunable oscillator is
divided into two channels, one of them containing the attenuator and modulator,
to which the i-f signal from the i-f oscillator is also applied, the other with
the standard resonator and phase shifter. Both the i-f and variable oscillator
signals are combined in a mixer to produce the i-f error signal. The second
circuit, using a series connection of amplitude modulator and standard resona-
tor, eliminates some defects inherent in the first. Both circuits are analyzed,
and the results of experiments performed on both of them presented. The exper-
iments were conducted in the 3-cm wavelength range. Oscillograms showing the
characteristic curves of the discriminators are reproduced.

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BUTORIN, V. M., DMITRIYEV, V. M., KRIVOSHEYEV, Ye. F., PAVLYUK, V. A.,
TRET'YAKOV, O. A.

"Impedance Matching Between a System of Superconducting Thin-Film Tunnel
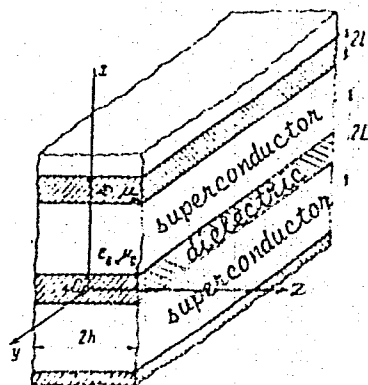Contacts and Free Space"

Abstract: The paper deals with the problem of plane electromagnetic wave
excitation of a periodic system of strip lines (see figure) consisting of
superconducting metal strips separated by a thin layer of a homogeneous
isotropic dielectric material with thickness $2l \sim 10^{-7}$ cm. Conditions are
found for matching between the impedance of this system and that of free
space, and the passband and amplitude of the field within the contact at
resonance are determined. The results may be treated as part of the solution
of the general problem for synthesis of tunnel contacts in which the effect
of weak superconductivity is observed. In reality, in the small-signal ap-
proximation the Josephson effect is described by a system of linear equations
which in this instance must be solved simultaneously with the Maxwell equa-
tions and the equation for the normal and superconducting current components

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' USSR

BUTORIN, V. M. et al., Radiotekhnika i Elektronika, Vol 17, No 9, Sep 72,
pp 1885-1892

as functions of the electric field intensity. The results of the work would
seem to imply that the tunnel effect will introduce certain corrections into
the condition found for impedance matching, but will not change it in any
essential way, and that matching of a system of Josephson contacts with free
space will be possible.

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USSR   UDC 669.295

GEGER, V. E., CHEPRASOV, I. M., DMITRIYEV, V. N., FEDOTOV, Ye. I.,
GAFUROVA, N. Sh.

"The Mechanism of the Interaction of Titanium Tetrach. .ide with Magnesium"

Ordzhonikidze, Isvestiya Vysshikh Uchebnykh Savedeniy, Tsvetnaya
Metallurgiya, No 4, 1972, pp 59-63.

Abstract: The mechanism of magnesium-thermal reduction of titanium is
studied by quick cooling of the reaction products. The discovery of sponge
titanium on the cover of a commercial reactor in specially cooled recesses
and analysis of the structure of the sponge indicate that the sponge struc-
ture of titanium is a result of secondary processes occurring following
the chemical reactions. The appearance of the primary peculiarities of
thermal combustion during magnesium thermal reduction of titanium allows
us to look upon the occurrence of this process from the standpoint of the
theory of combustion.

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Forming

USSR

UDC 621.771

VERESHCHAGIN, L. F., GUREVICH, YA. B., DMITRIYEV, V. N., KONYAYEV, YU. S., and POLYAKOV, YE. V., Moscow

"High-Temperature Gas Extrusion of Metals"

Abstract: An apparatus is described for extruding various materials at gas pressures to 10 kbars in the temperature range 20°-1000°C. The process of heating the blank under high gas pressures by passing a current through the blank was examined. Heating the preparations was shown to be feasible, with rates to 70°/sec, during which the deviation from a linear increase was not more than ±25°C. The amount of the initial heating of the gas was determined during its compression to 7 kbars in the apparatus. The processing of structural steels is feasible with the apparatus described.

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USSR

UDC 537.312.62

KONOVODCHENKO, V. A., DMITRIYEV, V. M., KOMAREVSKIY, S. K., LOKTIONOV, N. F.

"Nonisothermal Superconducting Bolometer. II"

Translation: The concept of creating a nonisothermal superconducting bolometer arises directly from the statement of the problem of thermal conductivity for an ordinary (isothermal) superconducting bolometer considering nonuniformity of the temperature distribution along its sensitive element. However, along with the useful effect used, the understanding of the fact of simultaneous existence of sections with different superconducting states in the sensitive element of the superconducting bolometer implies significant complication of the problem which in this statement is very simple for ordinary bolometers. In some practical cases the sections of the sensitive element in the intermediate state make an insignificant contribution to its total electrical resistance, and analysis of the operation of the superconducting bolometer can be greatly simplified if only its superconducting and

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USSR

KONOVODCHENKO, V. A., et al., <u>Tr. Fiz.-tekhn. in-t nizk. temperatur AN USSR</u>, 1970, vyp. 9, pp 72-84

normal sections are considered. This problem was investigated earlier by the authors. This paper is devoted to solving the most general stationary problem of thermal conductivity of nonisothermal superconducting bolometers and development of a method of graphoanalytical investigation of its characteristics. A system of equations for determining the current coordinates of the boundaries of the sections of the superconducting bolometer with different states of the superconductor was obtained as a result of solving this problem. A number of special cases of solving the system are investigated, which along with having independent value, also turn out to be very useful when writing and developing the program for its complete solution. There are 2 illustrations and a 4-entry bibliography.

2/2

USSR

UDC: 621.375.029.64

MENDE, F. F., PRENTSLAU, N. N., and DMITRIYEV, V. M.

"UHF Amplifier With Internal Negative Feedback"

Moscow, Radiotekhnika, No 2, 1972, pp 69-75

Abstract: In this paper, the authors propose an improvement to a
system they offered in an earlier paper (F. F. Mende, et al, Pri-
bory i tekhnika eksperimenta, No 3, 1967). The earlier system was
a frequency-stabilizing device using a uhf amplifier with inter-
mediate frequency amplification and amplitude modulation. While
the amplifier had good phase characteristics and high gain, the
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designed for high power at the high modulation frequencies. The
uhf amplifier offered in the present paper uses frequency modula-
tion of the reference oscillator and has no amplitude modulator,
thus avoiding the defect of the former model. A block diagram of
the device is given and its operation is explained. Basic design
expressions are developed. The new device was experimentally
1/2

- 2 -

USSR

MENDE, F. F. et al, Radiotekhnika, No 2, 1972, pp 69-75

tested; it was equipped with a reflex klystron operating at 17-20 MHz and an intermediate frequency of 10 MHz. Curves for experimental and theoretically derived data are shown. The authors express thanks to M. B. Golant, M. S. Khaykin, and R. T. Mina.

2/2

USSR

UDC: 8.74

ABAYS, Ye. A., DMITRIYEV, V. M.

"Program for Modeling and Analysis of Radio Electronic Circuits (MARS-1)"

V sb. Vopr. programmir. i avtomatiz. proyektir. (Problems of Design Programming and Automation--collection of works), Tomsk, Tomsk University, 1971, pp 65-79 (from RZh-Kibernetika, No 1, Jan 72, Abstract No 1V1065)

Translation: The authors describe principles and algorithms for analyzing the characteristics of AC and DC circuits, including algorithms for calculating sensitivity and finding the frequency responses of the circuits, and statistical analysis of electronic circuits. A. Doroshenko.

1/1

USSR

UDC: 8.74

ARAYS, Ye. A., DMITRIYEV, V. M.

"Program for Modeling and Analysis of Radio Electronic Circuits (MARS-1)"

V sb. Vopr. programmir. i avtomatiz. proyektir. (Problems of Design Pro-
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Translation: A program is described for modeling and analysis of elec-
tronic radio circuits by means of a computer designed to aid the planner
with the analytical part of his work. The basic purpose of the program
is to predict the behavior of an electronic circuit modification selected
by the designer on the basis of its mathematical model. The program pro-
vides for: 1) analyzing electronic circuits in the constant and steady-
-state mode; 2) analyzing transient processes in the circuit; 3) carrying
out various statistical studies (evaluating the effect of scatter in
parameters and aging of elements, analyzing circuit reliability, analyzing
the sensitivity of the circuit to variations in its internal parameters).
In addition to circuits with DC signals, the program can be used for ana-
lyzing circuits whose supply source is a trapezoidal pulse, a sinusoidal

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USSR

ARAYS, Ye. A., DMITRIYEV, V. M., Vopr. programmir. i avtomatiz. proyektir. Tomsk, Tomsk University, 1971, pp 44-64

signal, a linearly modulated sinusoidal signal, a damped exponential sig-nal, or a signal whose shape is given in tabular form. The MARS-1 pro-gram is designed for operation with linear DC models and with linear AC steady-state models, including pulse circuits. The MARS-1 algorithms are based on methods of circuit analysis: the method of loop currents, the method of junction potentials, the sectional method and a combination method. The MARS-1 program is formulated on the basis of the "Reader" interpretation system for solution of large problems. Bibliography of ten titles. V. Mikheyev.

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Devices

USSR

UDC: 621.376.332

MENDE, F. F., PRENTSLAU, N. N., and DMITRIYEV, V. M.

"UHF Discriminators with IF Error Signal"

Moscow, Radiotekhnika, Vol. 26, No 1, 1971, pp 51-56

Abstract: Two types of discriminator in which the error signal is at the intermediate frequency are proposed, the authors claiming for them freedom from difficulties encountered with such discriminators suggested by earlier work. The first circuit uses a parallel connection of the amplitude modulator and the standard resonator, such that the signal from the tunable oscillator is divided into two channels, one of them containing the attenuator and modulator, to which the i-f signal from the i-f oscillator is also applied, the other with the standard resonator and phase shifter. Both the i-f and variable oscillator signals are combined in a mixer to produce the i-f error signal. The second circuit, using a series connection of amplitude modulator and standard resonator, eliminates some defects inherent in the first. Both circuits are analyzed, and the results of experiments performed on both of them presented. The experiments were conducted in the 3-cm wavelength range. Oscillograms showing the characteristic curves of the discriminators are reproduced.

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BUTORIN, V. M., DMITRIYEV, V. M., KRIVOSHEYEV, Ye. F., PAVLYUK, V. A.,
TRET'YAKOV, O. A.

"Impedance Matching Between a System of Superconducting Thin-Film Tunnel
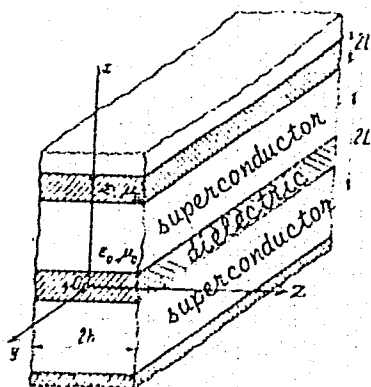Contacts and Free Space"

Abstract: The paper deals with the problem of plane electromagnetic wave
excitation of a periodic system of strip lines (see figure) consisting of
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found for matching between the impedance of this system and that of free
space, and the passband and amplitude of the field within the contact at
resonance are determined. The results may be treated as part of the solution
of the general problem for synthesis of tunnel contacts in which the effect
of weak superconductivity is observed. In reality, in the small-signal ap-
proximation the Josephson effect is described by a system of linear equations
which in this instance must be solved simultaneously with the Maxwell equa-
tions and the equation for the normal and superconducting current components

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' USSR

BUTORIN, V. M. et al., Radiotekhnika i Elektronika, Vol 17, No 9, Sep 72,
pp 1885-1892

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seem to imply that the tunnel effect will introduce certain corrections into
the condition found for impedance matching, but will not change it in any
essential way, and that matching of a system of Josephson contacts with free
space will be possible.

2/2

- 49 -

GEGER, V. E., CHEPRASOV, I. M., DMITRIYEV, V. N., FEDOTOV, Ye. I.,
GAFUROVA, N. Sh.

"The Mechanism of the Interaction of Titanium Tetrachloride with Magnesium"

Abstract: The mechanism of magnesium-thermal reduction of titanium is
studied by quick cooling of the reaction products. The discovery of sponge
titanium on the cover of a commercial reactor in specially cooled recesses
and analysis of the structure of the sponge indicate that the sponge struc-
ture of titanium is a result of secondary processes occurring following
the chemical reactions. The appearance of the primary peculiarities of
thermal combustion during magnesium thermal reduction of titanium allows
us to look upon the occurrence of this process from the standpoint of the
theory of combustion.

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USSR

UDC 62-52(047/1)

GRADETSKIY, V. G., DMITRIYEV, V. N., KOGAN, I. Sh.

"Status and Prospects for Development of Acoustical-Pneumatic Control Systems"

Translation: Results are presented from studies of physical phenomena in turbulent acoustical-pneumatic convertors (APC), demonstrating that APC can operate not only as discrete, but also as analog convertors. Existing APC designs and prospective areas of their application are studied. 3 Figures; 19 Biblio. Refs.

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GUREVICH, YA. B., DMITRIYEV, V. N., KONYAYEV, YU. S., OSTROVSKIY, G. A.,
and ENTIN, R. I., Moscow

"Composite Strengthening of Steel by Hydroextrusion"

Abstract: An attempt is made to achieve high indicators of strength and
ductility of structural steels by combination methods of strengthening:
1) thermomechanical treatment-strain aging of martensite and 2) treatment
for an ultra-fine austenite grain-strain againg of martensite. Experiments
were conducted using Cr-Ni-Si steels with a carbon content of 0.35% (steel
A), 0.45% (steel B), and 0.50% (Steel C). Treatment consisted of austeniza-
tion at 950°C, cooling to 850°C, rolling, water quenching, and tempering for
one hour at 200°C (steel A) and 300°C (steel B). Steel C was treated to
produce ultra-fine austenite by quenching from 900°C in oil, tempering for
one hour at 200°C, repeated austenization in heating to 900°C at the rate of
100°/sec, water quenching and tempering for one hour at 150 and 300°C.
Deformation of the martensite at room temperature was accomplished by hydro-
extrusion at pressures up to 25 kbar. From the heat treatments mentioned
above the following mechanical properties were achieved.
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